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Patent Application for:

HUB PAGES FOR SET TOP BOX STARTUP SCREEN

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HUB PAGES FOR SET TOP BOX STARTUP SCREEN

FIELD OF THE INVENTION

This invention relates generally to the field of electronic programming guides (EPGs). More particularly, certain embodiments of this invention are related to an EPG with a customized startup screen.

BACKGROUND OF THE INVENTION

Cable television (TV) systems often provide a channel that is used for displaying an electronic programming guide (EPG). The EPG provides a listing of the programs that are available on the cable system. Typically, the listing includes a plurality of time slots arranged in a column, wherein each time slot has associated with it a row of program information to thus form a grid pattern. The program information may include, for example, the name of the program, the cable channel on which the program may be found, names of actors, whether the program is broadcast in stereo, whether closed captioning is available and other associated information.

In many cable systems, a programming language such as Hypertext Markup Language (HTML) is used to format the EPG. This enables applications that are suited for viewing pages of the World Wide Web, such as web browsers that use Hypertext Transfer Protocol (HTTP), to display the EPG. Use of HTML enables the use of hyperlinks that may be selected by users to access desired Web pages. For

1	example, users are able to shop, make purchases, conduct banking and other
2	financial transactions, play games, conduct research and access vast amounts of
3	information by selecting a desired hyperlink. As a result, such HTML based EPGs
4	provide access not only to the subject matter that is available from cable systems,
5	but also provide access to the subject matter that is available from the Web.
6	Unfortunately, there exists an enormous amount of content available to users
7	of cable and satellite TV set top boxes these days, with the amount increasing
8	constantly. It becomes difficult for the user to access only the desired content
9	without navigation through numerous menus and pages to access the information
10	desired. Typically, a user of a regular portal site has to surf through layers of pages
11	to access desired information.
12	Through technological advancements such as fiber optics and others, the
13	data carrying capacity, or bandwidth, of cable systems continues to rapidly
14	increase. This enables much more information to be transmitted, from more
15	sources, over that which was possible just a short time ago. As such, it is
16	desirable that EPGs be provided that are capable of displaying additional
17	information in a user configurable manner that facilitates personalized human
18	interaction with TVs and cable systems.
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20	
21	**SUMMARY OF THE INVENTION**
22	The present invention relates generally to an Electronic Programming Guide.
23	Objects, advantages and features of the invention will become apparent to those
24	skilled in the art upon consideration of the following detailed description of the
25	invention.
26	In one embodiment of the present invention, a method of generating a
27	customized startup page for an Electronic Programming Guide (EPG) is provided.
28	A user establishes a user profile including preferences and location information that
29	is stored in a database at an EPG server. Upon receipt of a request from a Set Top

Box (STB) the EPG server invokes a HUB generator program that generates a custom startup page for the EPG based upon the user profile.

A method, consistent with certain embodiments of the present invention, of providing a customized startup page for an Electronic Program Guide, includes: receiving a request for the startup page from a Set Top Box associated with a user; finding a user profile corresponding to the user in a user database; generating a link to content based upon the user profile; and generating the startup page comprising at least the link to content.

An apparatus for generating an Electronic Program Guide startup Hub page for a Set Top Box, consistent with embodiments of the present invention, includes a mechanism for receiving an HTTP request from the Set Top Box. A user database stores a user profile. A Hub generating program receives the HTTP request and generates a query of the user database to retrieve the user profile from the user database. The Hub generating program generates a query of a site database for information associated with the user profile. The Hub generating program generates a Hub page by populating an HTML document with the information.

The above summaries are intended to illustrate exemplary embodiments of the invention, which will be best understood in conjunction with the detailed description to follow, and are not intended to limit the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the invention believed to be novel are set forth with particularity in the appended claims. The invention itself however, both as to organization and method of operation, together with objects and advantages thereof, may be best understood by reference to the following detailed description of the invention, which describes certain exemplary embodiments of the invention, taken in conjunction with the accompanying drawings in which:

FIGURE 1 is an exemplary block diagram of an interactive cable TV system.

1   **FIGURE 2** is an exemplary block diagram of a HUB generator system

2   consistent with the present invention.

3   **FIGURE 3** is an illustrative Electronic Programming Guide for news.

4   **FIGURE 4** is an illustrative Electronic Programming Guide for sports.

5   **FIGURE 5** is an illustrative Electronic Programming Guide for special events.

6   **FIGURE 6** is a flow chart illustrating one process of generating custom

7   startup pages consistent with embodiments of the present invention.

8   **FIGURE 7** is a flow chart depicting one process for establishing the user's

9   startup Hub pages consistent with embodiments of the present invention.

10   **FIGURE 8** is a flow chart illustrating one process carried out in the Hub

11   generator program 130 for assembling a startup Hub page.

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13   **DETAILED DESCRIPTION OF THE INVENTION**

14   While this invention is susceptible of embodiment in many different forms,

15   there is shown in the drawings and will herein be described in detail specific

16   embodiments, with the understanding that the present disclosure is to be

17   considered as an example of the principles of the invention and not intended to limit

18   the invention to the specific embodiments shown and described. In the description

19   below, like reference numerals are used to describe the same, similar or

20   corresponding parts in the several views of the drawings.

21   In the following description, numerous details are set forth in order to provide

22   a thorough understanding of the present invention. However, it will be apparent to

23   one of ordinary skill in the art that these specific details are not required in order to

24   practice the present invention. In addition, well known electrical structures and

25   circuits are shown in block diagram form and not described in detail in order so as

26   to not unnecessarily obscure the present invention. Additionally, although the

27   present invention is described in connection with an interactive cable system, it is

28   understood that this invention is applicable to other systems wherein electronic

29   programming guides (EPGs) are used.

1	Referring to **FIGURE 1**, a block diagram for an exemplary interactive cable
2	television (TV) system 10 is shown. The system 10 includes a media server 12 for
3	providing, on demand, movies and other programming obtained from a media
4	database 14. The media server 12 might also provide additional content such as
5	interviews with the actors, games, advertisements, available merchandise,
6	associated Web pages, interactive games and other related content. The system
7	10 also includes an electronic programming guide (EPG) server 16 and a program
8	listing database 18 for generating an EPG as will be described.
9	The media server 12 and EPG server 16 are coupled by a transmission
10	medium 20 to a set top box (STB) 22. The transmission medium 20 may include
11	a conventional coaxial cable network, a fiber optic cable network, telephone
12	system, a satellite communication system, a radio frequency (RF) system, a
13	microwave system, other wireless systems, a combination of wired and wireless
14	systems or any of a variety of known electronic transmission mediums.
15	The exemplary system 10 further includes a TV 24, such as a digital
16	television, having a display 26 for displaying an EPG. The STB 22 may be coupled
17	to the TV 24 and various other audio/visual devices 26 and Internet Appliances 28
18	by an appropriate interface 30, which can be any suitable analog or digital
19	interface. In one embodiment, interface 30 conforms to an interface standard such
20	as the Institute of Electrical and Electronics Engineers (IEEE) 1394 standard. The
21	STB 22 may include a central processing unit (CPU) 32 and memory 33 such as
22	Random Access Memory (RAM), Read Only Memory (ROM), flash memory, mass
23	storage such as a hard disc drive, or other electronic storage media, etc. Such
24	memory and storage media is suitable for storing data as well as programmed
25	processes for execution on the CPU 32. STB 22 may include circuitry suitable for
26	audio decoding and processing, the decoding of video data compressed in
27	accordance with a compression standard such as the Motion Pictures Experts
28	Group (MPEG) standard and other processing to form a controller or central hub.
29	Alternatively, components of the STB 22 may be incorporated into the TV 24 itself,

thus eliminating the STB 22. Further, a computer having a tuner device may be substituted for the TV 24 and STB 22.

By way of example, the STB 22 may be coupled to devices such as a personal computer, video cassette recorder, camcorder, digital camera, personal digital assistant and other audio/visual or internet related devices. In addition, a data transport architecture, such as that set forth by an industry group which includes Sony Corporation and known as the Home Audio-Video Interoperability (HAVi) architecture may be utilized to enable interoperability among devices on a network regardless of the manufacturer of the device. This forms a home network system wherein electronic devices and Internet appliances are compatible with each other. Further, the STB 22 runs an operating system suitable for a home network system such as Sony Corporation's Aperios™ real time operating system. Of course, other operating systems could also be used.

The STB 22 includes an infrared (IR) receiver 34 for receiving IR signals from an input device such as remote control 36. Alternatively, it is noted that many other communication methods may be utilized, such as wired or wireless control, radio frequency, etc. In addition, it can be readily appreciated that the input device 36 may be any device suitable for controlling the STB 22 such as a remote control, personal digital assistant, laptop computer, keyboard or computer mouse. In addition, the input device 36 may be a control panel located on the TV 24 or the STB 22.

The STB 22 may also be coupled to an independent service provider (ISP) host 38 a connection 40 to thus provide access to services on the Internet. The ISP host 38 provides various content to the user that is obtained from a content database 42. STB 22 may also be used as an Internet access device to obtain information and content from the Internet.

An EPG for depicting programming information and other content is generally accessed by selecting a hyperlink from an HTML document. A computer program which resides at the EPG server 16 then generates an EPG page including a grid table having a plurality of table cells representing programming.

1   The server side computer programs may be implemented in C++, Open Data Base

2   Connectivity (ODBC) and Microsoft Foundation Class (MFC) programming

3   languages, although other suitable languages may be used. The computer

4   program then connects to the program listing database 18 in order to associate

5   selected TV programming information such as available programs, time slots,

6   channel numbers, etc. with selected table cells to form an HTML based EPG

7   having hyperlinks to more detailed programming information. The EPG can then

8   be displayed by a Web browser which preferably supports HTML version 4.0 or

9   higher and cascading style sheets (CSS). EPGs in use today which are based on

10   HTML typically use an input device, such as remote control 36, to access

11   programming through the EPG.

12   In accordance with the present invention, a "Hub" startup page is generated

13   according to a user's profile including location, preferences, etc. in order to permit

14   the user to access his or her most frequently desired programming and content.

15   This Hub page is delivered to the user at the time of turning on the television or STB

16   to permit immediate access to content through this custom profiled page.

17   Referring now to **FIGURE 2**, set top 22 includes a web browser 110 that

18   sends requests, such as HTTP formatted requests 120, to a HUB generator

19   program 130 situated on the EPG server 16. HUB generator program 130 may be,

20   for example, written as a JAVA program. HUB generator program 130 replies to

21   the request 120 with a HUB page (a customized HTML startup document) 140 that

22   is displayed as a custom formatted EPG on the display 26. HUB generator

23   program 130 generates the HUB page in accordance with a stored user profile

24   containing information about user preferences, location, etc. The user selects what

25   type of HUB startup page is displayed so that navigation to favorite programming

26   and web content can be simplified. Any number of categories of startup page

27   templates can be used (e.g. Home, Sports, News, Children, etc.) as starting points

28   for building a custom Hub page.

29   When the request 120 is received by the HUB generator program 130 of

30   EPG server 16, a query 150 is generated to identify the user profile, location,

preferences, etc. for the HTTP request 120. The query 150 is processed against a user database 160 containing user preferences, which returns the information required to profile the user at 165. Query links 170 are generated as a result of the query 150 and processed against one or more site databases 174, 178 through 180 (A-C) to produce query results 190 which are returned to the HUB generator program 130. Site databases may be periodically updated as necessary in any suitable manner to provide the appropriate content or links used in generating the Hub page. For example, Site database 180 may contain weather information which is periodically updated by making periodic queries 192 through the Internet 194 (or by any other suitable connection) to a remote server 198 (e.g, a weather service site). In this example, the server may provide weather information based upon the zip code, area code, city name, etc. contained in the user profile for areas served by the EPG server 16. Moreover, the query link 170 may, in some embodiments, directly query web sites stored on remote servers such as 198 through the Internet 194 to obtain the needed information. Multiple site databases may be used to store multiple links and content associated with various types of information that may be supplied to the user through the startup page. In other embodiments, information may be periodically updated through any suitable site serving as a source of information via the Internet.

HUB generator program 130 takes the query results 190 and generates a customized HUB page 140 that is returned to the STB 22's web browser 110. This permits the user to access a customized startup HUB that provides shortcuts to the information specifically desired by the user when the television system is turned on. This process will be described in greater detail later.

Referring now to **FIGURE 3**, an exemplary news oriented EPG HUB 300 is illustrated. In this embodiment, a horizontally oriented grid table 306 includes a number of program cells configured as menu selection tabs (icons) 310. In this embodiment, menu selections for web sites as well as television programs are illustrated. In this embodiment, selection tabs (icons) 310 can be scrolled right or left by actuating right arrow icon 314 or left arrow icon 318 to reveal other

selectable tabs 310 representing cells in the grid table. These tabs 310 represent user selected links to favorite news item locations, either being television programming, Internet web sites or other content. News items may be selected for display on the Hub page based on the type of news a viewer is particularly interested in (e.g., domestic, international, food, finance, state, local, etc.) In a lower region 324 of EPG HUB 300, stock market indices are displayed. Such indices may be updated by reference to a remote server on the Internet, for example. In certain embodiments, information such as stock market indices may be used as links to further information. Various menu selections for navigation to other pages is provided in region 330, and the current (e.g. default or most recently tuned) television channel programming appears in a live video window 340 in this embodiment. Other arrangements of similar information can also be used without departing from the invention.

Referring to **FIGURE 4**, sports EPG HUB 400 is shown for depicting sports information. The sports EPG HUB 400 includes a sports scores grid table 408 that depicts, for example, the final scores of college basketball games held recently for teams of interest to, and selected by the user. These scores are then retrieved from an appropriate server via the Internet, for example, to provide the user with the latest information. The sports EPG HUB 400 also includes a sports programing grid table 412 which depicts selected Web sites and programming in the form of selection tabs (icons) 420 that may be selected by the user to launch a web site or television program. Additional tabs 420 can be revealed by selection of right arrow icon 314 or left arrow icon 318 In the embodiment shown, the sports scores grid table 408 automatically scrolls vertically to reveal additional scores. Again, other menu selections are provided as 330 and live video of a favorite default program or last tuned channel is shown in live video window 340. Other arrangements are also possible.

Referring to **FIGURE 5**, another EPG HUB 500, a Home Hub, is shown for depicting an arrangement for providing information relating a user's (subscriber's) home location. By way of example, special events, special programming, and

other topics of local interest can be displayed. The Home EPG HUB 500, in this example, includes an icon 508 on the EPG that depicts, for example, a link to information relating to a special event being promoted that are of interest to the user based on a user profile. Local events such as festivals, concerts, film festivals, special TV programming, etc. can be showcased in region 508. EPG HUB 500 also shows a weather grid table 512 which briefly depicts the weather forecast for the next several days. These weather forecasts may be presented in a shorthand graphical summary and may take the form of selection tabs (icons) 520 that may be selected by the user to access more detailed weather information. The weather forecast information and local interest information are based upon the user's profile location information identifying the location of the user, and can be obtained by accessing an appropriate weather server on the Internet, for example. Other arrangements are also possible.

With reference to **FIGURE 6**, the process for creating the customized HUB for use as the EPG startup page is illustrated as process 600. The process can be broken into two distinct stages. The first stage 610 describes establishing the user profile, which can be done upon initial use of the Set Top Box 22, or can be entered to reconfigure the user profile at any time the user desires. This first stage is described in greater detail in connection with **FIGURE 7**. The second stage 620 describes generation of the startup page and is described in greater detail in connection with **FIGURE 8**.

With reference to **FIGURE 6**, upon first powering up the STB 22, or subsequent reset or if the user desires to change the user profile, the process starts at 625 with the user preparing a profile at 630. This can be accomplished by any suitable process such as selections from a menu, filling out form information, or providing key words, etc. The profile preferably also includes location information (which can be derived from zip code, city and state, or telephone number information in the user profile). The user profile is sent to the EPG server 16 at 635. The user profile is stored at the EPG server 16 in user database 160 until needed.

1   Whenever selected by the user, or upon startup of the STB 22 or television

2   24, the web browser 110 of the STB 22 sends HTTP request 120 to the EPG server

3   16. Upon detecting arrival of a request at 645, the HUB generator program 130

4   queries the user database 160 at 650 to obtain the profile information needed to set

5   up the startup page. The user profile is linked to site databases such as 174, 178

6   and 180 as well as possibly to remote Servers containing data such as 198 via the

7   Internet, to determine appropriate links and/or content to return as part of the

8   startup EPG at 655. The appropriate links are returned to the HUB generator

9   program at 660 and the HUB generator program assembles the Hub startup page

10   at 665. This startup page is then sent, at 670, to the STB for display on display 26

11   and use by the user. Process 620 then awaits the next request at 645.

12   Referring now to **FIGURE 7**, a process for establishing a user profile for

13   generation of a Hub page is illustrated as 700. The process starts at 704 with

14   initialization of the STB 22 at 710 upon initial power up of the STB 22. As a part of

15   the initialization process, the user provides profile information at 714 as part of the

16   registration process. This is accomplished by making selections of desired

17   interests, default Hub page template as well as personal information (e.g. age, sex,

18   hobbies, preferences, viewing habits, etc.) that can be used to select default

19   content. The Hub generator program 130 generates and saves a default Hub page

20   format at 718 based upon the user profile and the populated Hub page is sent to

21   the Set Top Box 22's browser 110 at 722. If the user is happy with this default Hub

22   page at 726, no action is required to keep it for future use. If, however, the user

23   desires to modify the default page at 722, a modification process 730 is entered

24   which allows the user to customize the page by adding or deleting links in greater

25   detail and otherwise reconfigure the Hub page. Once the modification is complete

26   at 730, the modified page is saved as a template for the new Hub page at 740.

27   Many variations of this process are possible without departing from the invention.

28   With reference to **FIGURE 8**, a more detailed process 800 is described for

29   generation of the Hub page at Hub generator program 130. This process starts at

30   804. At 810, the process awaits a receipt of an HTTP request 120 from web

browser 110 for a startup Hub page. In accordance with the preferred embodiment, when such a request is received, the Hub generator program loads an Enterprise Java Bean (EJB) at 814 representing a table in the user database 160 and calls the EJB to identify the information relating to the user's particular profile. Based upon this profile, the Hub generator program generates one or more queries 170 to local and/or remote databases at 818. The local and/or remote databases return links, images, content, etc. as required in accordance with the queries 170 at 822. This information is used to populate the stored Hub page template corresponding to the user profile at 826 to create the startup Hub page. This Hub page is then sent to the web browser 110 of STB 22 at 830 and the process returns to 810 to await the next query. Of course, many variations in this process are possible without departing from the invention.

Those skilled in the art will recognize that the present invention has been described in terms of exemplary embodiments based upon use of a set top box containing a programmed processor such as a RISC (Reduced Instruction Set Computer). However, the invention should not be so limited, since the present invention could be implemented using hardware component equivalents such as special purpose hardware and/or dedicated processors which are equivalents to the invention as described and claimed. Similarly, general purpose computers, microprocessor based computers, micro-controllers, optical computers, analog computers, dedicated processors and/or dedicated hard wired logic may be used to construct alternative equivalent embodiments of the present invention.

Those skilled in the art will appreciate that the program steps used to implement the embodiments described above can be implemented using disc storage as well as other forms of storage including Read Only Memory (ROM) devices, Random Access Memory (RAM) devices; optical storage elements, magnetic storage elements, magneto-optical storage elements, flash memory, core memory and/or other equivalent storage technologies without departing from the present invention. Such alternative storage devices should be considered equivalents.